

Remarks/Arguments

The Applicant has carefully considered the non-final Office action dated October 27, 2011, and submits this response. In this response, the Applicant is amending to more clearly define the present invention. Specifically, the Applicant is amending the claims to recite treated fibers that "exhibit anti-bacterial properties and eliminate Legionella Pneumophila at temperatures above 250°C," as explained on at least page 15 of the English translation of the application as filed. Even in light of these amendments, the Applicant is not adding new matter to the application. Accordingly, the Applicant would appreciate if the Examiner would acknowledge acceptance of these amendments in the next Office communication.

Claim Rejections - 35 USC § 103

The Examiner is rejecting claims 56, 57, 62-65, 67-70, and 75 as being unpatentable over Rohrbach (U.S. patent no. 6,514,306) in view of Li (U.S. patent no. 6,197,072). However, the Examiner has not met the burden of establishing a prima facie case of obviousness because the combined teachings of the Rohrbach and Li references do not teach or suggest every element

of the amended claims, as discussed in detail below. Thus, the Applicant respectfully solicits withdrawal of this rejection.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference or combination of prior art references, must teach or suggest all the claim limitations.

In this case, the combined teachings of the Rohrbach and Li references do not teach or suggest every claim limitation, namely a filter made from treated fibers, whereby each of the fibers is "previously treated with an anti-bacterial compound so that the anti-bacterial compound is integrated into all of the body and core of said fiber so that the treated fibers store the anti-bacterial compound inside the treated fibers and exhibit anti-bacterial properties and eliminate Legionella Pneumophila at temperatures above 250°C." As the Examiner points out in the Office action, "Rohrbach does not appear to teach that the anti-bacterial compound is integrated into all of the body and core of the fiber so that the treated fibers store the anti-bacterial

compound inside the treated fibers to eliminate Legionella Pneumophila without releasing the anti-bacterial compound." The Examiner also indicates that the Rohrbach also fails to disclose treated fibers that "exhibit anti-bacterial properties at temperatures above 200°C."

To provide a teaching of the claim limitation directed toward fibers having an anti-microbial agent integrated into all of the body and core of each fiber, the Examiner cites the Li patent, which discloses fibers having a Triclosan ester derivative diffused therein. According to the Examiner, "it would have been obvious to one of ordinary skill in the anti-bacterial fiber art at the time the invention was made to form the filter of Rohrbach, wherein the fibers comprise triclosan which is diffused within each individual fiber, as taught by Li, motivated by the desire of forming a conventional filter comprising anti-bacterial fibers known in the art as being predictably suitable where anti-bacterial properties are desirable, as the fibers are imparted with durable and long-lasting germicidal, fungicidal and antimicrobial properties to fabrics." With regard to the claim limitation directed to the ability of treated fibers to exhibit anti-bacterial properties at temperatures above 250°C, the Examiner asserts that:

Regarding the claimed property, although the prior art combination does not disclose the claimed property, it is reasonable for one of ordinary skill in the art to expect that the claimed anti-bacterial properties naturally flow from the treated fibers of the prior art combination, since the prior art combination teaches an invention with a substantially similar structure and chemical composition (nonwoven fabric comprising the claimed fibers and a TRICLOSANTM anti-bacterial composition and the claimed biocide integrated into the body and core of the fiber) as the claimed invention. Products of identical structure and composition cannot have mutually exclusive properties. The burden is on the Applicant to prove otherwise.

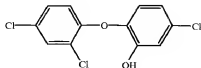
The Applicant respectfully points out that the Li patent is silent regarding the use of the treated fibers at elevated temperatures, namely temperatures in excess of 200°C. To the contrary, the Li patent only shows efficacy at 120°C (see Examples 1 and 2) and 320°F (~160°C) (see Examples 3 and 4). Moreover, the teachings of the Li patent make clear that the combination of the teachings of the Rohrbach and Li references that the Examiner suggests, namely forming the filter of the Rohrbach patent with the fibers diffused with a triclosan-based compound disclosed in the Li reference, does not exhibit an anti-bacterial effect against *Legionella Pneumophila* at temperatures above 250°C, as the claims require.

Namely, the Li patent makes teaches that the any antimicrobial effect is the result of the Triclosan compound itself, not the esterified Triclosan derivative and that Triclosan volatilizes at high temperatures. As explained in the Li patent:

In actuality, the use of triclosan esters merely provides an effective manner of applying and diffusing triclosan itself within a fabric substrate. It is believed that the antimicrobial properties of a textile treated with triclosan ester are obtained from the triclosan compound itself which is very slowly generated by hydrolysis of the ester in an aqueous or moisture-containing environment.

The Li patent goes on to explain the significant differences between Triclosan and a Triclosan ester derivative. As set forth in column 4 of the Li patent, Triclosan has the following properties:

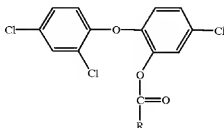
Triclosan is illustrated by the following Figure (I):



Such a compound, with a free hydroxyl group, is easily dissolved in water at high pH. Triclosan also has a tendency to volatilize at high temperatures. (Emphasis added.)

On the other hand, the Li patent describes Triclosan ester derivatives as follows:

The preferred ester derivatives, having esterified the hydroxyl group of the triclosan, are illustrated by the flowing Figure (II):



wherein R is selected from the group consisting essentially of C.sub.1 -C.sub.10 alkyl or cycloalkyl, aryl, and substituted aryl. Specifically, the preferred compounds are triclosan acetate, triclosan propionate, triclosan benzoate, triclosan 4-nitrobenzoate, and triclosan hexanoate. Particularly preferred is triclosan acetate. In another embodiment, R is a phosphate group so as to form a triclosan phosphate ester. *A compound defined by Figure (II) does not dissolve in water and generally has a much lower volatility than triclosan itself...The oleophilicity of this particular ester derivative facilitates exhaustion onto the hydrophobic fiber surfaces and further facilitates diffusion into each individual fiber. To the contrary, triclosan itself, with a free hydroxyl moiety, does not readily exhaust onto the fiber surfaces and cannot appreciably diffuse into the individual*

fibers in an aqueous dye bath. (*Emphasis added.*)

Due to the different volatilities, moieties, and solubilities of Triclosan and Triclosan ester derivatives, the Li patent teaches a diffusion process for treating fibers with a esterified Triclosan derivative. While the Triclosan ester derivative does not provide any antimicrobial effect, the esterified Triclosan derivative, as opposed to Triclosan, has the ability to diffuse into the fibers. After the fibers are diffused with the Triclosan derivative, the Triclosan ester derivative breaks down into Triclosan via hydrolysis of the ester in an aqueous or moisture-containing environment. Once the esterified Triclosan breaks down into Triclosan, the fibers have an anti-bacterial property. However, this anti-bacterial effect does not occur at high temperatures because Triclosan has a high volatility, as the Li patent teaches. Specifically, Triclosan has a boiling point of 120°C and a flash point of 162.2°C¹.

The Li patent goes onto explain that the diffusion process offers benefits over the conventional methods of applying an anti-bacterial agent, namely coating, impregnation, and surface treatments. As set forth in column 5 of the Li patent:

¹<http://en.wikipedia.org/wiki/Triclosan>

Generally, a surface treatment application, such as the mere coating or impregnation within the interstices of fabrics with triclosan esters or triclosan itself, can be easily removed by a high pH detergent solution within a laundry cycle, and thus would not provide a durable, long-lasting antimicrobial treatment for textiles. Triclosan esters diffused within the fibers of a fabric are not in contact with the washing liquid and therefore cannot be easily removed.

While the diffusion process may prevent contact with a washing liquid, the diffusion process does not prohibit exposure to high temperatures. Since Li makes clear that it is the Triclosan itself, not the Triclosan ester derivative, that provides the anti-bacterial effect and that Triclosan is highly volatile, the diffused fibers of the Li patent do not have an antimicrobial effect against *Legionella Pneumophila* at temperatures above 250°C. As such, modifying the filter of the Rohrbach patent to include the diffused fibers of the Li reference would likewise not be effective against *Legionella Pneumophila* at temperatures above 250°C. Thus, the combined teachings of the Rohrbach and Li references do not disclose every element of the amended claims.

Unlike fibers of the Li patent, the fibers of the present invention are formed via an extrusion process, where the temperatures reach 450°C. At such temperatures, the anti-

bacterial agent becomes integrated into the body and core of each fiber, which allows the fibers of the claimed invention to exhibit an anti-microbial effect against Legionella Pneumophila at temperatures above 250°C. The fibers of the Li patent, which are treated with a diffusion process, whereby the temperatures reach approximately 120°C, are not effective at temperatures about 250°C because the diffusion process does not integrate the Triclosan into the fiber in such a way to prevent the Triclosan from evaporating at such elevated temperatures. Since the treated fibers of the Li patent do not exhibit an anti-bacterial effect against Legionella Pneumophila at temperatures above 250°C, modifying the filter of the Rohrbach patent to include the Li fibers, as the Examiner suggests, would likewise not be effective against Legionella Pneumophila at high temperatures. Since the combined teachings of the Rohrbach and Li references do not disclose every element of the amended claims, the Applicant respectfully requests withdrawal of this rejection.

The Examiner is also rejecting claims 71-74, 76, and 77 under 35 U.S.C. § 103(a) as being unpatentable over Rohrbach (U.S. patent no. 6,514,306) in view of Li (U.S. patent no. 6,197,072) further in view of Falder (U.S. publication no.

2003/0031687), Wolf (U.S. patent no. 2,920,997) and Farina (U.S. patent no. 5,603,941). However, the Examiner has not met the burden of establishing a prima facie case of obviousness because the combined teachings of these references do not teach or suggest every element of the amended claims, as discussed in detail below. Thus, the Applicant respectfully solicits withdrawal of this rejection.

As stated above, the combined teachings of the Rohrbach and Li patent do not disclose fibers that "previously treated with an anti-bacterial compound so that the anti-bacterial compound is integrated into all of the body and core of said fiber so that the treated fibers store the anti-bacterial compound inside the treated fibers and exhibit anti-bacterial properties and eliminate Legionella Pneumophila at temperatures above 250°C," as the amended claims require. None of the Falder, Wolf, or Farina references provide a teaching of the claim limitation. As such, the combined teachings of the Rohrbach, Li, Falder, Wolf, and Farina references do not disclose every element of the amended claims. Accordingly, the Applicant likewise requests withdrawal of this rejection.

In view of the foregoing, the Applicant respectfully requests reconsideration of the rejections set forth in the Office action and hereby solicits favorable consideration and allowance of the claims. Should the Examiner have any questions regarding this response, the amendments submitted herewith, or the allowability of the claims, the Applicant would appreciate if the Examiner would contact the undersigned attorney of record at the telephone number provided below for purposes of facilitating prosecution of this application.

Respectfully submitted,

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